Parcel C, RU-C5 Additional Characterization
Hunters Point Naval Shipyard
San Francisco, California

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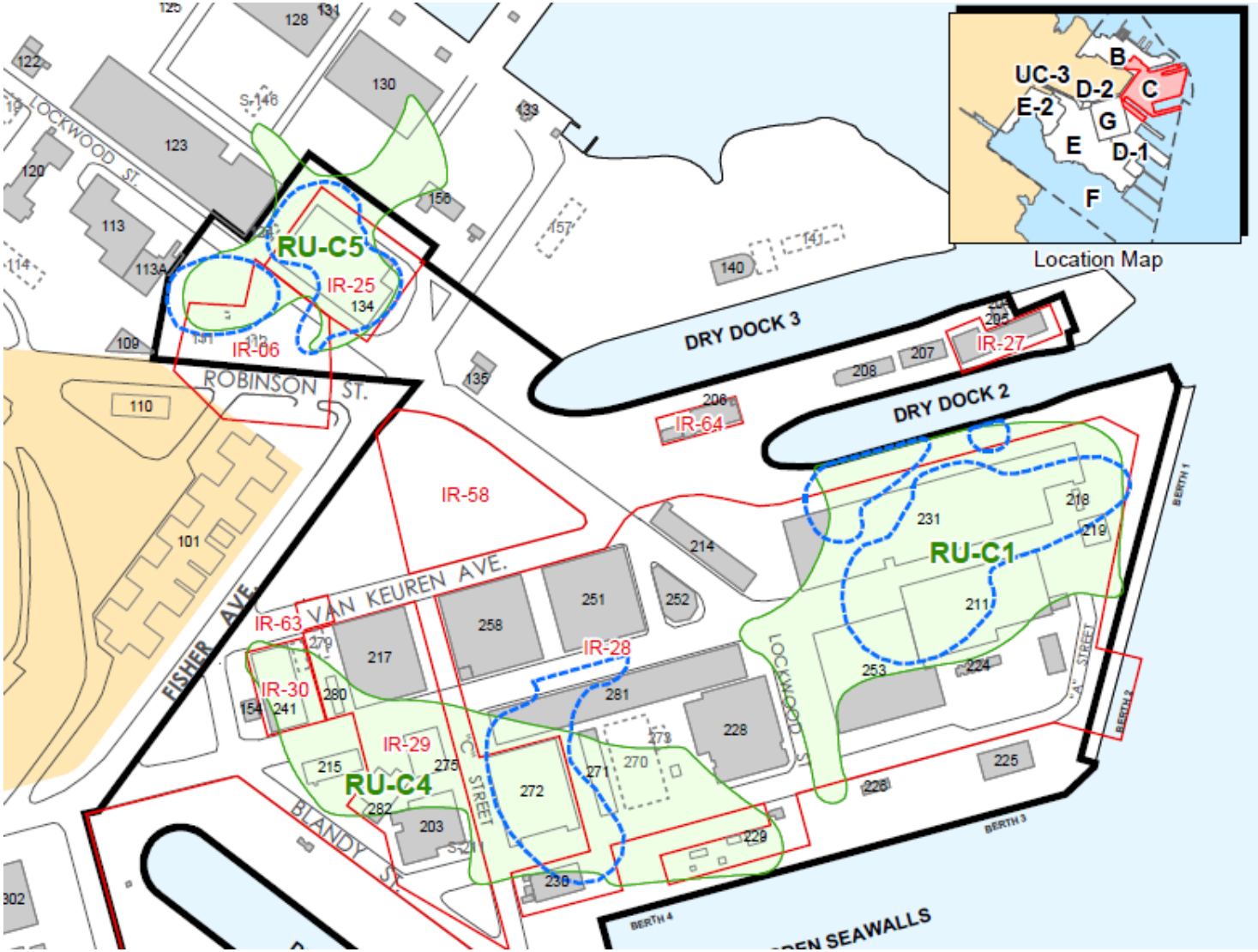
Parcel C, RU-C5 Location



RU-C5 Background and RA Summary

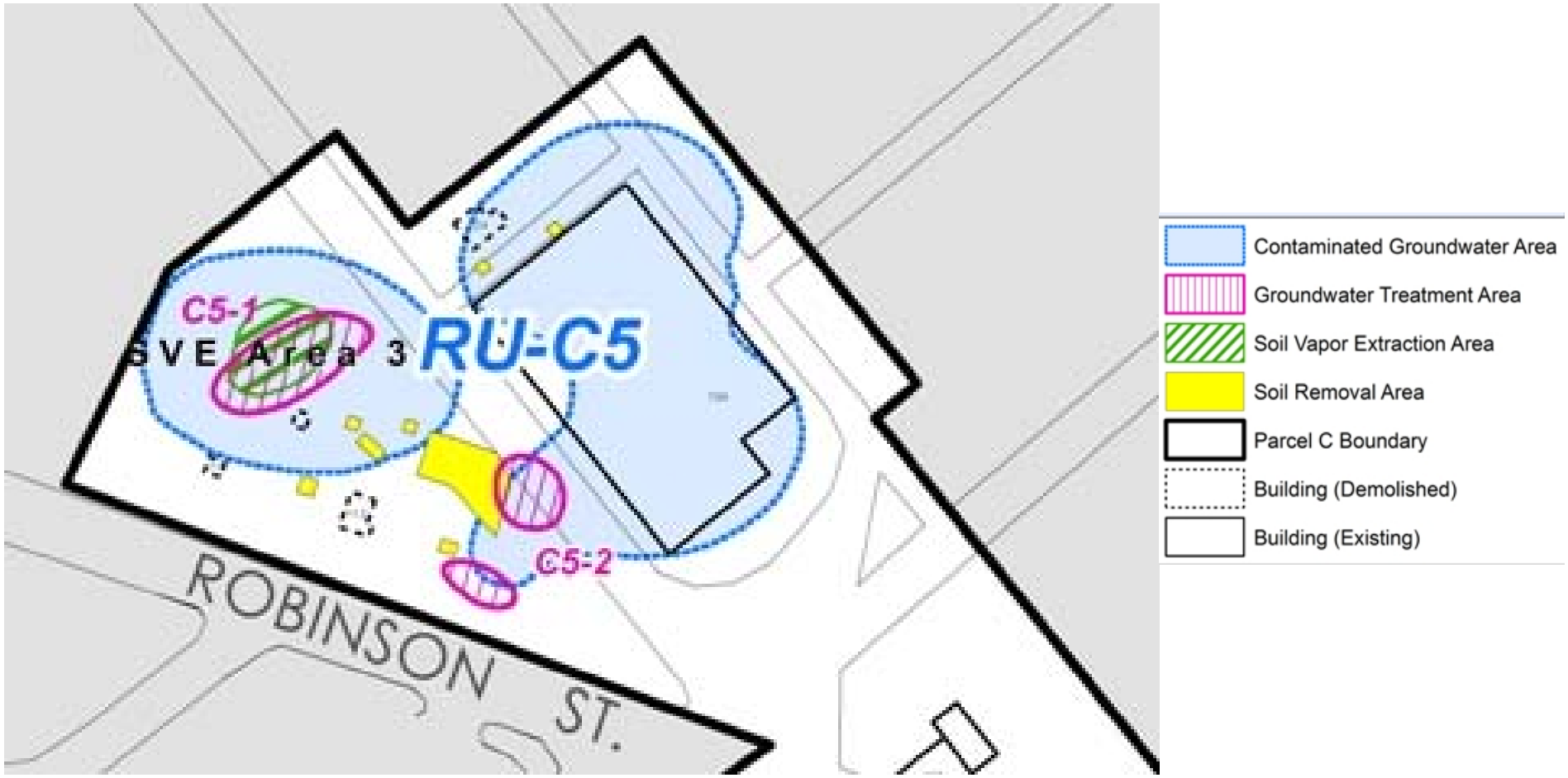
- RU-C5 includes IR-06, which contained a former fuel tank farm and IR-25, which contains Building 134. From 1940 to 1974, Building 134 was used by as a machine shop for parts cleaning. Since base closure in 1974, the building had been leased by Cal Marine Works Machine Shop and used as a warehouse. In 1985, the building was leased to Odaco, Inc., a refrigeration company.

- RU-C5 contains five separate groundwater plume areas (C5-1 through C5-5) and three soil vapor extraction areas (SVE Areas 3, 4, and 5).

- The current RA includes soil excavations 11-2, 10-3, 10-4, and 10-5 (completed), ISB groundwater treatment for VOCs at Plume C5-1 (ongoing), and ISB groundwater treatment for hexavalent chromium at Plume C5-2 (ongoing). In addition, SVE Area 3 has been installed and is under operation.

- RU-C5 also contains Plumes C5-4 and C5-5. Treatment of these plumes were not included in the current project scope, as it had been anticipated that the historic treatability studies and excavations would meet the remedial action objectives for these areas.

Current RU-C5 Remedial Action Areas



RU-C5 Additional Investigation Overview

The Navy has identified the need to collect additional site characterization data at RU-C5 to refine the remedial action work based on the following:

- Post-treatment sampling at Plume C5-1, indicate CVOC concentrations extended beyond the original boundary of the remedial treatment area at the northern (downgradient) edge of the plume.
- Recent groundwater data from monitoring wells in and around Plumes C5-4 and C5-5 collected in March and August 2013, indicate elevated CVOC concentrations remain in these areas.
- Soil gas sampling following completion of the multi-component treatability study at Building 134 in 2011 (CDM, 2012), indicate CVOC concentrations remain above Soil Gas Action Levels (SGALs). Additional soil gas sampling was recommended following subsurface cooling.

Plume C5-1 Post-Treatment Conditions

Post-treatment sampling results in downgradient well IR06MW67A collected on July 30, 2014 (12 weeks after completing the ISB injection activities) indicates further sampling is necessary:

- PCE was detected a concentration of 380 µg/L; above the ZVI treatment criteria of 15 µg/L.
- TCE was detected at a concentration of 3,000 µg/L; above the ZVI treatment criteria of 110 µg/L.
- Cis-1,2-DCE was detected at a concentration of 1,000 µg/L; below the ISB treatment criteria of 2,100 µg/L.
- Vinyl chloride was detected at a concentration of 66 µg/L; above the ISB treatment criteria of 25 µg/L.

Data also indicates that in addition to the completed ISB treatment at Plume 5-1, ZVI treatment and SVE may be warranted.

Building 134 (Plumes C5-4 and C5-5) Post-Treatability Conditions

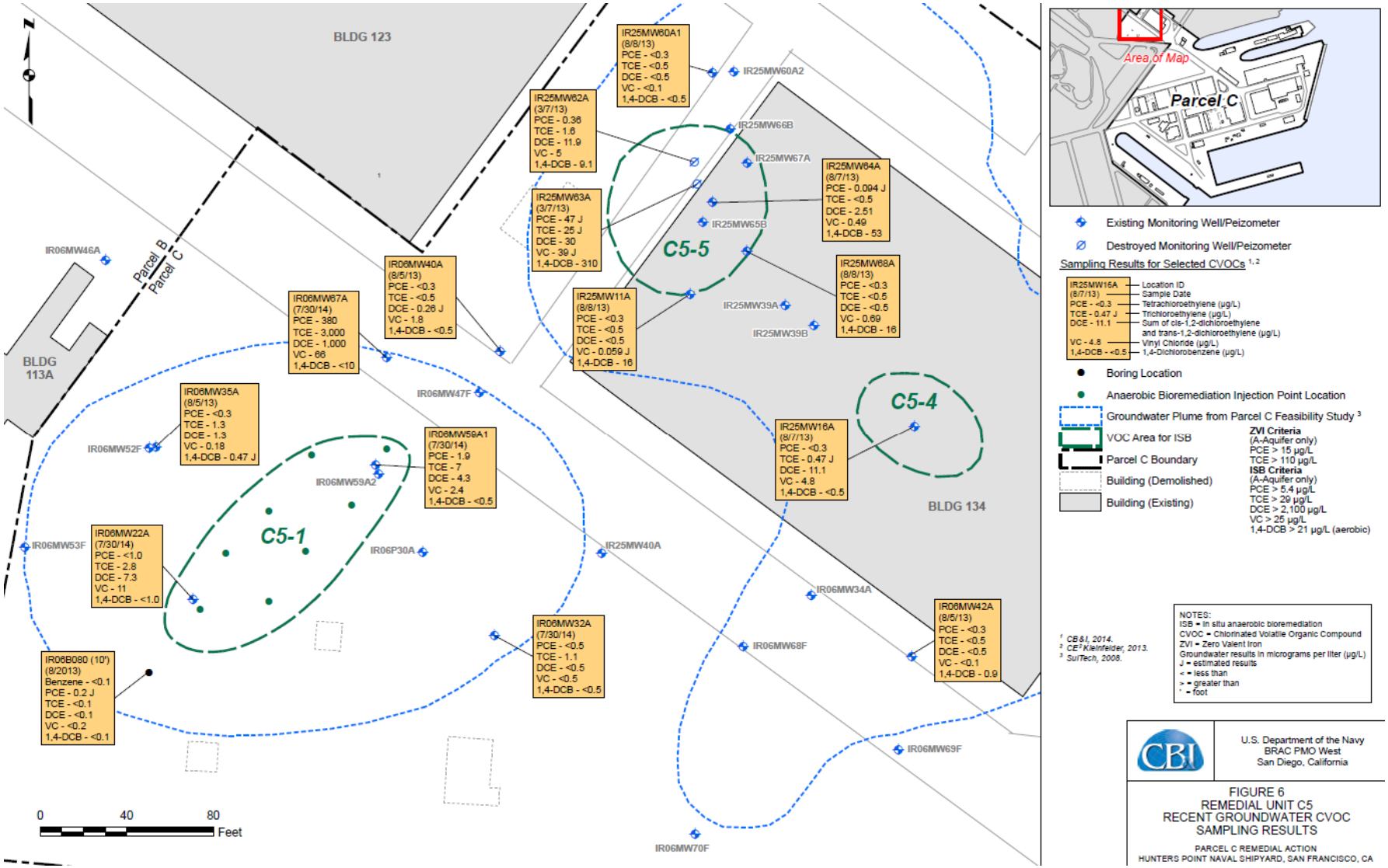
- Treatability study from 2011 included the use of ZVI with enhance anaerobic ISB for CVOCs and thermal enhancement of the ZVI and ISB treatment processes using thermal conduction heating in the areas of plumes C5-4 and C5-5 and SVE Areas 4 and 5 (KCH, 2012).

- Post-treatment soil gas sampling show that several locations exceeded SGALs for multiple VOCs primarily in the vicinity of the former degreaser in the northwest portion of the building. Highest concentrations are as follows:

  - 4,100 ppbv of PCE (SGAL 67.5 ppbv)
  - 3,800 ppbv of TCE (SGAL 251 ppbv)
  - 12,000 ppbv of VC (SGAL 240 ppbv)
  - 28,000 ppbv of cis-1,2-dichloroethene (SGAL 10,240 ppbv)
  - 240,000 ppbv of 1,2-dichlorobenze (SGAL 38,587 ppbv)
  - 570 ppbv of 1,2,4-Trichlorobenze (SGAL 43.9 ppbv)
  - 58,000 ppbv of 1,4-dichlorobenze (SGAL 40.9 ppbv)
  - 930 ppv of benzene (SGAL 108.6 ppbv)
  - 19,000 ppbv of chlorobenzene (SGAL 12,577 ppbv)

- In addition, recent GW monitoring at MW IR25MW63A and IR25MW64A showed CVOC concentrations above both the ISB and ZVI treatment criteria (see Slide 8).

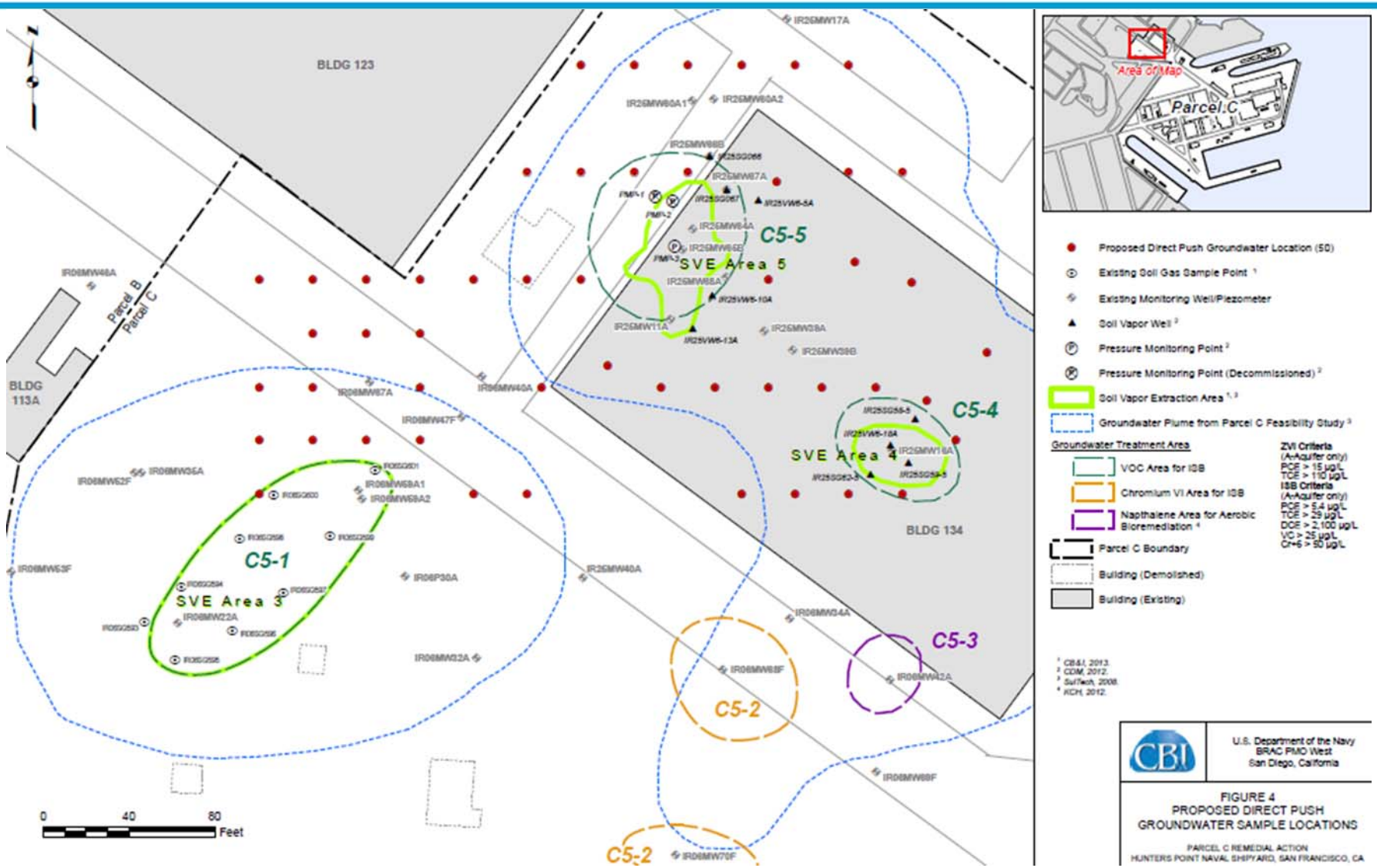
RU-C5 Recent Groundwater Sampling Results



Proposed Additional TRIAD Investigation at RU-C5

- Additional VOC characterization northeast of well IR06MW67A, in the vicinity of Plumes C5-4 and C5-5, and inside Building 134 is needed to determine if further remedial action is warranted.
- Initially, 50 direct-push soil borings will be advanced (see Slide 10) to collect continuous soil cores for logging of soil characteristics and to collect PID readings, which will be used to select both shallow and deep soil samples for on-site mobile laboratory analysis.
- A groundwater grab sample will be collected at each boring location using a Hydropunch™ sampling device (or equivalent). The onsite mobile laboratory will analyze the samples for VOCs using EPA Method 8260B.
- Following review of the groundwater analytical data, the Navy will install and sample up to 20 soil vapor monitoring probes. The soil vapor monitoring probes will be located in the area(s) where VOC concentrations in groundwater are greater than the ZVI or ISB treatment criteria.

RU-C5 Proposed Soil Boring and GW Sampling Locations



RU-C5 Additional Characterization Schedule

Submit Draft Work Plan and SAP Addendum	October 24, 2014
Agency Review Comments	December 9, 2014
Final Work Plan and SAP Addendum	January 29, 2015
Field Mobilization	February 3, 2015
Field Work Completion	March 16, 2015
Draft Tech Memo	June 28, 2015
Agency Review Comments	August 25, 2015
Final Tech Memo	September 9, 2015

Questions?